NHTSA
DRIVER DISTRACTION RESEARCH:
Past, Present, and Future

July 18, 2000

By: Dr. W. Riley Garrott

Vehicle Research and Test Center
Chief, Vehicle Stability and Control Division

NHTSA
People Saving People
http://www.nhtsa.dot.gov

Presentation Overview

- **What is the distraction problem?**

- **Past NHTSA driver distraction/ workload research**

- **Current research**

- **Upcoming research**

Driver Distraction:
What is the Problem?

Link to video clip of driver inserting a CD while drinking a soft drink and driving on a test track.

Driver Distraction

- **Distraction is a known safety problem**

- **New communication and information technologies may make the problem worse**

Driver Distraction Research Objectives

- **How can we measure driver distraction?**

- **What are the effects on safety of:**
  - ž Using wireless phones while driving?
  - ž Heavy truck dispatching systems?
  - ž Route navigation systems?
  - ž Other multi-function systems?

Past Research

- **Truck Driver Workload Study**
  (1992 – 1995)

- **Wireless Communications Study**
  (1993 – 1997)

- **Route Navigation Systems Studies**
  (1992 – 2000)

Truck Driver Workload Study: Goals

- **Develop and evaluate workload assessment tools**

- **Conduct on-road research with instrumented tractor-semi trailer using professional drivers**

Truck Driver Workload Study: Test Video

Link to video clip of truck driver dialing a cellular phone while driving on a public road.

7/20/00

Truck Driver Workload Study: Results

- **Comparative assessment of distraction-related crash risk more useful than absolute measures**

- **Workload assessment tools (visual allocation, lane tracking, etc.) widely accepted**

Wireless Communication Report

■ **Assessed current state of knowledge on impact of phone use while driving**

Wireless Communication Report

- **Does cellular telephone use while driving increase the risk of a crash?**

    ž "Yes, at least in some cases."

- **Will crashes likely increase with increasing number of cellular telephones in the fleet?**

    ž "Yes."

7/20/00

Wireless Communication Report

- **Magnitude of traffic safety problem?**

  ž Unknown due to insufficient data

- **"…conversation itself is the most prevalent single behavior associated with cellular telephone related crashes..."**

  ž Hands-free phones will not totally solve the problem.

Wireless Communication Report

- **Recommended actions**
  - ž Improve data collection and reporting with appropriate training of enforcement personnel
  - ž Conduct research
  - ž Perform benefits analyses
  - ž Encourage states to enforce their reckless and inattentive driving laws
  - ž Improve consumer education

Route Navigation Systems Studies

TravTek Study

- **Route navigation systems installed in 100 rental vehicles in Orlando**
  - Approximately 1 million miles driven in 10 months
  - Destination entry locked out while vehicle is in motion

TravTek Study Results

- **TravTek systems did not degrade driving safety**
  - ž Safety neutral on congested roads
  - ž Safety neutral to safety positive on un-congested roads

Destination Entry Study: Goals

- **Compare distraction potential among:**
  - ž Destination entry using 4 route navigation systems, including voice activation
  - ž Phone dialing
  - ž Radio tuning
- **Compare performance for younger (35-) vs. older (55+)subjects**

Destination Entry

Link to video clip of driver entering a destination into a route navigation system while driving on a test track.

Destination Entry Study: Results

- **Visual/manual destination entry while driving is ill-advised**

- **Voice recognition technology less distracting than visual/manual destination entry**

- **Older drivers had more difficulty with visual/manual destination entry**

- **Age differences disappeared for voice input**

15-Second Rule

- **15 second rule was developed by the SAE Safety and Human Factors Committee**

- **Intended to provide guidance to designers as to what route navigation functions should be available to drivers while driving**

- **Developed by consensus between researchers and designers**

15-Second Rule Study

- **Evaluated proposed SAE recommended practice for route navigation systems (e.g., destination entry functions)**

- **10 older (55-69) subjects performed static and dynamic tasks, including destination entry**

15-Second Rule Study

Link to video clip of driver entering a destination into a route navigation system while sitting in a parked vehicle as part of NHTSA's 15 second rule testing.

15-Second Rule Study: Results

■ **Static test not sufficient to identify tasks with significant distraction potential**

■ **Revision of 15-second rule proposal recommended**

■ AutoPC test track study

AutoPC Test Track Study

- **Cooperative study between NHTSA and Transport Canada**

- **Compare voice and non-voice technologies for:**

  - ž Phone dialing
  - ž Radio tuning
  - ž E-mail retrieval

- **Determine how drivers learn to use complex multi-function technologies**

AutoPC Test Track Study

- **Driving performance and eye glance behavior will be analyzed**

- **Results will help determine what tasks are appropriate for drivers to access while driving on public roads**

Research Currently Underway

- **Wireless telephone interface on-road study**

Hand-held

Link to video clip of driver dialing and talking on a hand-held wireless phone while driving on a test track.

7/20/00

Wireless Telephone Interface Study

NHTSA
People Saving People
http://www.nhtsa.dot.gov

Hands-free (manual dialing, hands-free talking)

*Link to video clip of
driver dialing and talking
on a hands-free
wireless phone while
driving on a test track.*

Wireless Telephone Interface Study

Totally hands-free (voice dialing, hands-free talking)

Link to video clip of driver dialing and talking on a totally hands-free (AutoPC) wireless phone while driving on a test track.

7/20/00

Wireless Telephone Interface Study

- **Naturalistic Study**
  - ž Instrumented vehicles driven by members of general public for 6 weeks

Wireless Telephone Interface Study

- Compare distraction potential for different interface designs

- Compare use patterns for different interface designs

- Determine conditions under which drivers are willing to use wireless phones

- **Major portion of future research will be performed on NADS**

National Advanced Driving Simulator

NHTSA
People Saving People
http://www.nhtsa.dot.gov

- **National Advanced Driving Simulator (NADS) becomes operational in 2000**

  Link to video clip of National Advanced Driving Simulator (NADS)

Upcoming NADS Research

- **Planning underway for series of projects on driver workload and distraction**
  - ž Due to Wireless Communications Devices
  - ž Due to In-Vehicle Information Systems
- **Development of Research Tools**
  - ž Standard NADS Driver Distraction Test Methods, Procedures, & Test Courses
  - ž Assessment Techniques for Evaluating Cognitive Driver Distraction

Questions ?